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**Engineering Development of a Pilot Scale Molten Salt Oxidation
Unit***

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Note: We are currently constructing a new engineering development unit. Initial testing will be conducted this summer. Data will not be available until then. Therefore we will not be able to meet the February submittal date for the paper.

Abstract

Lawrence Livermore National Laboratory's (LLNL) Mixed Waste Management Facility (MWMF) will be a national testbed for demonstrating and evaluating the integration and operation of mixed-waste treatment technologies for low-level, organic, mixed-wastes; demonstrating alternatives to incineration; demonstrating compliance with applicable federal and state incineration-based standards; and meeting other Resource Conservation and Recovery Act Land Disposal Restrictions. "Demonstration of Waste Treatment Technologies in the Mixed Waste Management Facility at LLNL" is a complementary paper in this conference which describes the first technologies that are planned for implementation in the MWMF, including Molten Salt Oxidation (MSO). This paper will focus on the engineering development and design features of the MSO unit.

In MSO oxidant gas, such as air, and wastes are injected into a bed of molten salt, comprised of sodium carbonate. The organic constituents of the mixed waste are destroyed through the combined effect of pyrolysis and oxidation. LLNL is constructing an engineering development molten salt oxidation unit for evaluating critical engineering issues prior to pilot scale deployment. Because of the nature of the salt at high temperature, materials of construction and details of design play an important role in a successful deployment. Waste injection into the salt and controlling salt entrainment in the off-gas are also important issues. This unit will be the prototype for the MWMF design.

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This paper describes the engineering design, compares it to previous designs, and presents experimental data for surrogate wastes. Details such as material studies and injector design are discussed, as well as how the design of the MWMF MSO system has evolved.